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OPPD
Omaha Public Power District

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LIC-02-0035
March 22, 2002

U. S. Nuclear Regulatory Commission
ATTN.: Document Control Desk
Washington, DC 20555-0001

References:
1. Docket 50-285
2. EMF-2087(P)(A), "SEM/PWR-98: ECCS Evaluation Model for PWR LBLOCA Applications", Revision 0, June 1999
3. Letter from OPPD (S. K. Gambhir) to NRC (Document Control Desk), Annual Report for 1999 Loss of Coolant Accident (LOCA)/Emergency Core Cooling System (ECCS) Models Pursuant to 10 CFR 50.46, dated April 28, 2000 (LIC-00-0042)
4. Letter from OPPD (S. K. Gambhir) to NRC (Document Control Desk), Annual Report for 2000 Loss of Coolant Accident (LOCA) and Emergency Core Cooling System (ECCS) Models Pursuant to 10 CFR 50.46, dated April 10, 2001 (LIC-01-0032)
5. Fort Calhoun Station Unit No. 1 Updated Safety Analysis Report, Section 14.15, "Loss of Coolant Accident"

SUBJECT: Report of Significant Change/Error in the Large Break Loss of Coolant Accident (LOCA) /Emergency Core Cooling System (ECCS) Models and Evaluations Pursuant to 10 CFR 50.46

In accordance with 10 CFR 50.46(a)(3)(i), the Omaha Public Power District (OPPD) is submitting a report of a significant change/error in the large break LOCA portion of the LOCA/ECCS models and evaluations. 10 CFR 50.46(a)(3)(i) states that a significant change or error is one that results in a calculated peak fuel cladding temperature different by more than 50°F from the temperature calculated for the limiting transient using the last acceptable model, or is a cumulation of changes or errors such that the sum of the absolute magnitudes of the respective temperature changes is greater than 50°F. This report identifies the cumulative effects associated with the quantification of peak clad temperature (PCT) associated with various code errors identified in the Framatome ANP large break LOCA/ECCS analysis for Fort Calhoun Station (FCS) Unit No. 1. Reference 2 describes the methodology utilized by Framatome ANP to model Combustion Engineering plants such as FCS.

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An error was identified in the code TOODEE2 with respect to the cladding thermal expansion correlation in the Beta phase temperature range. The error caused a discontinuity in the predicted cladding thermal expansion between the transition temperature region and the Beta phase temperature region at cladding temperatures above 1773°F. The estimate of the PCT impact of the error correction on the large break LOCA analyses for FCS is -1°F.

Also, an error in the fast flux input to RDX2LSE was identified. The fast flux was not input in the first input block, but was input into all following input blocks. Since the fast flux was not input in the first input block, RDX2LSE ignores the fast flux input in all following blocks, and calculates the fast flux from the power level input in the input block and a fast flux conversion constant. Therefore, the fast flux used by the code was incorrect by the difference between the calculated values and the input values. The PCT impact of the error correction on the large break LOCA analyses for FCS is estimated to be +4°F.

Additionally, Framatome ANP (formerly Seimens Power Corporation (SPC)) committed (in response to the NRC 1997 inspection at SPC) to perform addition verification and validation and to update or create user's manuals, theory manuals, and programmers manuals for Framatome ANP's (SPC's) primary codes. One of the primary codes was the RFPAC code. The RFPAC code performs the refill and reflood calculations for the large break LOCA event in the SEM/PWR-98 evaluation model. A number of minor errors were identified and corrected as a result of the additional verification and validation activities. The estimate of the PCT impact of the error corrections on the large break LOCA analyses for FCS is +48°F.

Attachment 1 provides a summary of the large break LOCA PCT status, incorporating the results of these analyses, consistent with Reference 4 (Annual Report for 2000 LOCA/ECCS Models pursuant to 10 CFR 50.46). These results show that the large break LOCA PCT is 1956°F, thus remaining less than the 10 CFR 50.46(b)(i) limit of 2200°F. In Reference 5, large break PCT was reported as 1905°F. These changes will also be reflected in the 2001 10 CFR 50.46 Annual Report (to be submitted in April 2002).

Because the sum of the absolute magnitude of the above changes and errors exceeds 50°F, the change is classified as significant and this report is being submitted pursuant to the requirements of 10 CFR 50.46(a)(3)(i). Since these results represent a quantification requiring no further analysis and the PCT remains less than 2200°F, no further analytical or operational mitigating strategies are required. The large break LOCA is being reanalyzed for Cycle 21 due to operating condition changes and the code changes identified above have been incorporated.

If you have any questions or require additional information, please contact Dr. R. L. Jaworski of my staff at 402-533-6833.

Sincerely,

R. T. Ridenoure
Division Manager
Nuclear Operations

RTR/TRB/trb

Attachment

c: E. W. Merschoff, NRC Regional Administrator, Region IV
A. B. Wang, NRC Project Manager
W. C. Walker, NRC Senior Resident Inspector
Winston & Strawn

Fort Calhoun Station Large Break LOCA
Peak Clad Temperature Margin Utilization Summary

		Clad Temp (°F)
LICENSING BASIS		
	Analysis-Of-Record (implemented April 2001)	**1905**
MARGIN ALLOCATIONS (ΔPCT)		
A.	**Error in TOODEE2 Clad Thermal Expansion**	**-1**
B.	**Error in Fast Flux input to RODEX2**	**4**
C.	**RFPAC V&V Findings**	**48**
LICENSING BASIS + MARGIN ALLOCATIONS		**1956**